PUP JOINT WITH INTEGRAL WING NUT RETENTION SHOULDER

This application is a continuation, of application Ser. No. 651,646, filed May 22, 1996 now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a pup joint and, more particularly, to a pup joint which includes means for maintaining the wing nut and retainer segments in a position adjacent the male sub at all times.

2. Description of Related Art

Pup joints are relatively small lengths of pipe used in the oilfield industry to conduct fluids from one piece of equipment to another. Typical pup joints comprise a length of pipe having a male sub located at one end, a female sub located at the other end and a wing nut for connecting the male end of one pup joint to the female end of another pup joint. The male sub includes a spherical sealing surface, and the female sub includes a mating conical sealing surface and a set of external threads. The wing nut is retained on the pup joint by means of a shoulder or a set of retainer segments and engages the threads of the female sub to secure two pup joins together.

Maintaining the wing nut and retainer segments adjacent the male sub end has been somewhat of a challenge in prior art pup joints. In certain prior art pup joints constructed of heavy-wall tubing, the wing nut and retainer segments are held in place by means of an interference fit with the male sub tubing. In lighter weight pup joints, however, this interference fit does not exist. Therefore, when a pup joint is held in a non-horizontal position, the wing nut is permitted to slide down the pup joint, thus creating difficulties during installation.

SUMMARY OF THE INVENTION

Therefore, it is an object of the present invention to provide a pup joint which includes means for maintaining the wing nut and retainer segments adjacent the male sub.

According to the present invention, this and other objects and advantages are achieved by providing a pup joint comprising a length of pipe, a female sub integral with one end of the pipe and having external threads formed thereon, a male sub integral with the other end of the pipe, a wing nut for threadedly connecting the male sub to the female sub, a set of retainer segments for retaining the wing nut on the pup joint, and a retention shoulder extending radially outwardly from the male sub to maintain the wing nut and retainer segments on the male sub. In a preferred embodiment of the invention, the pipe and the male and female subs are comprised of a single forging, and the retention shoulder is formed by machining the male sub. The retention shoulder therefore provides a means for preventing the wing nut and retainer segments from sliding down the pup joint.

These and other objects and advantages of the present invention will be made apparent from the following detailed description, with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevation of one embodiment of a prior art pup joint;

FIG. 2 is a front elevation of another embodiment of a prior art pup joint;

FIG. 3 is a perspective view of a portion of the pup joint of the present invention

FIG. 4 is a partial front elevation of the pup joint of the present invention; and

FIG. 5 is a perspective view of a forging used to construct a pup joint according to one embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, a prior art pup joint **10** is shown which comprises a length of pipe **12**, an integrally formed male sub **14** at one end of pipe **12** and an integrally formed female sub **16** at the other end of pipe **12**. Male sub **14** includes a spherical sealing surface **18**, while female sub **16** includes a mating is conical sealing surface **20**. Female sub **16** also includes a set of threads **22** formed on an exterior surface thereof, and pup joint **10** further comprises a wing nut **24** having a set of internal threads **26** formed therein for engaging the threads **22** of a female sub **16** of another pup joint **10**. Nut **24** is retained on pup joint **10** by means of retainer segments **28**, which simultaneously engage a rearward shoulder **30** extending radially inwardly from the interior surface of nut **24** and a forward shoulder **32** extending radially outwardly from the exterior surface of male sub **14** to thereby prevent nut **24** from pulling off of pup joint **10** (to the right in FIG. **1**) when nut **24** is threaded onto the female sub of another pup joint. In each of the embodiments described herein, it should be recognized that the pup joint, including the length of pipe and the male and female subs, includes a fluid flow passage extending completely longitudinally therethrough.

Referring to FIG. **2**, another prior art pup joint, indicated generally at **34**, is shown which comprises a length of pipe **36**, a male sub **38** and a female sub **40**. In this pup joint, male sub **38** and female sub **40** are threaded onto corresponding ends of pipe **36**. Prior to threading male sub **38** onto pipe **36**, a wing nut **42** is assembled over pipe **36**. Wing nut **42** comprises a rearward shoulder **44** extending radially inwardly from an interior surface **46** thereof, and wing nut **42** is retained on pup joint **34** by means of the engagement of rearward shoulder **44** with a forward shoulder **48** of greater diameter than rearward shoulder **44** extending radially outwardly from male sub **38**.

Referring to FIG. **3**, the pup joint of the present invention, indicated generally at **110**, is shown to comprise a length of pipe **112**, a male sub **114** located at one end of pipe **112** and a female sub **116** located at the other end of pipe **112**. Male sub **114** and female sub **116** may either be formed integral with pipe **112** as a single forging or manufactured individually and then threaded onto the ends of pipe **112**. Male sub **114** comprises an enlarged diameter section **118** and a spherical sealing surface **120**. Female sub **116** comprises an enlarged diameter section **122** having external threads **124** formed thereon and a conical sealing surface (not shown) adapted to mate with spherical sealing surface **120** of another pup joint **110**.

Referring to FIG. **4**, pup joint **110** also comprises a wing nut **126** having internal threads **128** designed to engage the threads **124** of another pup joint **110** to thereby secure two pup joints **110** together. Nut **126** is retained on pup joint **110** by means of one or more retainer segments **130**. Retainer segments **130** comprise an inner diameter corresponding generally to the outer diameter of enlarged diameter section **118**, a front face **132** and a rear face **134**. When nut **126** and retainer segments **130** are assembled on male sub **114**, front